

Study Of

REFORMULATED GASOLINE (RFG)
DISTRIBUTED OUTSIDE OF
NEW HAMPSHIRE'S FOUR COUNTY
NONATTAINMENT AREA

Prepared by the

NEW HAMPSHIRE DEPARTMENT OF
ENVIRONMENTAL SERVICES

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I. GENERAL

In June 2000, in response to continuing concerns relative to contamination of the State's water resources from the gasoline additive methyl tertiary-butyl ether (MTBE), HB 1569-FN (Chapter Law 299) was passed (see Appendix B for full Chapter Law language). This legislation included language commissioning the Department of Environmental Services (DES) to study the amount of reformulated gasoline (RFG) delivered to areas of the state where RFG is not currently required. Specifically, DES was instructed to analyze levels of MTBE in a minimum of 100 samples, of all different grades of gasoline, taken from a representative selection of gasoline distribution facilities located outside Hillsborough, Merrimack, Rockingham, and Strafford counties (New Hampshire's "four county area").

While "conventional gasoline" is not permitted in areas where RFG is required, there is no federal or state law that prohibits RFG in areas where it is not required. The purpose of this study was to determine if state legislation prohibiting the supply of RFG to areas where it is not required would make a significant difference in the amount of MTBE in gasoline delivered to those areas.

II. BACKGROUND

RFG is a federal fuel formulation program that provides substantial air quality benefits from vehicles and equipment powered by gasoline. RFG is required in New Hampshire in Hillsborough, Merrimack, Rockingham, and Strafford counties (the "four county area"). The "conventional gasoline" that meets formula specifications for distribution in New Hampshire outside the four county area does not certify for distribution in the four county area where RFG is required. However, RFG does certify for distribution in all areas of the State. Because of the federal Clean Air Act (CAA) requirement that RFG contain a minimum of 2% oxygen by weight (the "oxygenate mandate"), RFG delivered to New Hampshire is expected to contain higher volumes of MTBE¹ than conventional gasoline.

Earlier this year, while considering proposed language in HB 1569 that would prohibit the distribution and sale of RFG outside the four county area, the House Science, Technology & Energy Committee heard testimony from stakeholders relative to how much RFG is delivered outside to areas where it is not required. Although nothing in current federal and state statute prohibits the sale of RFG outside of areas where it is required, distributors of gasoline testified that RFG is more expensive than conventional gasoline, and that cost generally drives the decision on what to deliver to New Hampshire customers. However, conclusive data representing how much RFG is delivered outside the four counties was not immediately available to the Committee for their review.

¹ MTBE contains oxygen, and is the additive of choice for refiners serving the Northeast to help meet the oxygenate mandate because of its cost-effectiveness and favorable blending characteristics.

During work sessions associated with proposed HB 1569, the Committee requested that DES outline a plan to cost-effectively study the amount of RFG being delivered outside the four county area. Given the comparative levels of MTBE in RFG and conventional gasoline, DES testified to the Committee that a reasonable assessment of the amount of RFG being delivered outside the four county area could be done by studying MTBE levels in samples taken from a representative number of retail gasoline stations located in areas where RFG is not required. The final language of HB 1569 (Chapter Law 299:3) instructed DES to analyze the MTBE content of 100 or more gasoline samples from dispensing facilities located outside the four county area.

III. METHODOLOGY

In the six counties (Belknap, Carroll, Cheshire, Coos, Grafton and Sullivan) where RFG is not required (the “six county area”), an estimated 160,500,000 gallons² of gasoline are consumed annually. There are 581 gasoline distribution facilities that include retail, state, municipal, and institutional facilities (there are 759 facilities inside the four county area). For this study, DES focused on retail facilities in the six county area, visiting 54 retail gasoline distribution facilities (in 23 municipalities – see Appendix B) and obtaining 140 samples for MTBE analysis.

For analyzing the MTBE content of gasoline samples, DES procured a PetroSpec GS-1000 Gasoline Analyzer from the U.S. Environmental Protection Agency (EPA). At each location, DES purchased small quantities of regular, mid-, and premium grades of gasoline, and screened each for MTBE content using the PetroSpec Gasoline Analyzer. In each instance, it was explained that this testing was not compliance-related, but rather for a study commissioned by the Legislature. Tabulated results of the data are provided in Attachment A.

In addition to oxygen and MTBE (methyl tertiary-butyl ether, the primary oxygenate of choice for refiners servicing the Northeast RFG market) content, the PetroSpec is also capable of analyzing for a number of other components and characteristics of gasoline, including: MeOH (methanol, can be used as an oxygenate), EtOH (ethanol, considered the primary alternative to MTBE as an oxygenate in the event that MTBE is phased out), ETBE³ (ethyl tertiary-butyl ether), TAME³ (tertiary-amyl methyl ether), DIPE³ (di-isopropyl ether), TBA (tertiary-butyl alcohol), Benzene, Aromatics, Olefins, Saturated Hydrocarbons, RON⁴ (Research Octane Number), MON⁴ (Measured Octane Number), R+M/2⁴ (average of RON and MON, the traditional advertised octane rating for gasoline), RON Engine Bias⁴, MON Engine Bias⁴, DI⁴ (driveability index), T50⁴ (temperature in °C at which 50% of product will vaporize), T90⁴ (temperature in °C at which 90% of product will vaporize), E200⁴ (percent of product which will evaporate at 200 °C), E300⁴ (percent of product which will evaporate at 300 °C).

² This represents 27% of all gasoline distributed in New Hampshire (reference: New Hampshire 1996 Periodic Emissions Inventory, prepared by DES in May 1999).

³ These additives contain oxygen and can be used as oxygenates, however they (ETBE, TAME, DIPE) are ethers as MTBE is, so similar groundwater contamination characteristics can be expected.

⁴ These characteristics are measures of performance-based requirements for gasoline.

IV. LIMITATIONS OF STUDY

The specifications for RFG in the federal CAA include a maximum benzene content, a minimum oxygen content, and a prohibition on heavy metals. All other specifications for RFG are performance-based emissions requirements which are measured at refineries using complex chemical laboratory analyses. RFG certification estimates of gasoline can be made using EPA's Complex Model. A number of characteristics of the gasoline must be measured to provide inputs to run the model. Because an assessment of whether a gasoline sample certifies as RFG, measuring simply for the MTBE and oxygen content of the sample will not determine whether or not it is RFG. A measurement of the oxygen content will, however, provide insight as to whether the sample could certify as RFG (required to 2% by weight). Since the cost of oxygenates (and other modifications in the recipe and refining process which are necessary to meet overall requirements of the gasoline in the presence of high volumes of oxygenates) is generally higher than other components of gasoline, it is not unreasonable to conclude that samples with 2% oxygen by weight are certifiable of RFG.

DES believes that the analyzer we used for testing of gasoline samples was in good operating condition, was appropriately calibrated, and was operated properly. However, the data collected was expressly for the purpose of this special legislative study. In addition, as previously mentioned, a total of 140 samples was collected from 54 facilities. While this data provides a great deal more information for the Legislature to work with relative to how much RFG is being delivered outside the four county area, it is essentially a snapshot of the industry. A more comprehensive study of gasoline samples from facilities outside the four county area would be necessary to provide conclusive evidence of how much RFG is being delivered in areas where it is not required.

V. RESULTS

Attachment A tabulates the results of analysis of samples for MTBE and oxygen content. Attachment B is a map of New Hampshire with the towns where sampling was done highlighted. Out of the 140 samples collected, it was determined that 7 contained enough oxygen to certify as RFG. In general, it takes approximately 11% MTBE by volume to achieve 2% oxygen by weight. A comparison of MTBE and oxygen levels in many instances indicates the presence of other oxygenates in the samples.

Consistent with testimony received from representatives of the gasoline supply and distribution industry, levels of MTBE were typically 0-3% in regular grades and generally higher for mid- and premium grades (this is because oxygenates typically enhance octane levels in the gasoline). Of the seven samples which had oxygen contents of 2% or greater, six were either mid or premium grades.

In addition to the seven samples that had oxygen contents of 2% or greater, it was also determined that 25 (18%) of the 140 samples had higher than expected levels of MTBE, ranging from 4% to less than 10% by volume with corresponding oxygen weights above 1% but less than

2%. There are no state or federal rules in place which prohibit the use of oxygenates in conventional gasoline, however the elevated levels of oxygenates in some samples may suggest that some mixing of RFG and conventional gasoline may have occurred either at the terminal or at the retail facility⁵.

VI. ADDITIONAL STUDY

While the language in HB 1569 specifically commissioned DES to study the MTBE content of gasoline samples taken from the six county area, the PetroSpec Gasoline Analyzer also screens for other components of gasoline, including other oxygenates. It was pointed out earlier in the study that a comparison of MTBE and oxygen contents of many of the samples suggests that other oxygenates were present in many of the samples. Specifically, TAME was found in 126 out of 140 samples, ETBE was found in more than half of the samples, and DIPE was found in a few samples (see tabulated results in Appendix A). This is significant because all of these compounds are ethers, which are expected to have characteristics similar to MTBE in groundwater, and thus present similar threats to water resources. The only alcohol compound found in any of the samples was TBA, and that was only in a few samples. None of the samples were found to contain any ethanol or methanol.

In addition to screening of samples from the six county area where RFG is not required, DES also collected and analyzed 40 samples from 21 facilities (13 municipalities – see Appendix B) in New Hampshire's four county area where RFG is required (see tabulated results in Appendix D). All 40 samples were found to have oxygen contents consistent with RFG (2% by weight), and all 40 contained MTBE in concentrations ranging from 3.9% to 14%. The number of samples containing other oxygenates (TAME, ETBE, DIPE, TBA, ethanol, methanol) was consistent with the findings from samples screened in the six county area where RFG is not required.

VII. CONCLUSIONS

Given the limitations of the analyses performed as part of this study, it is not possible to derive an exact percentage of how much gasoline delivered outside areas where RFG is required could certify as RFG. However, the data suggests that the volume is roughly 5% (7 of 140 samples). Testimony delivered by representatives from the gasoline supply and distribution industry to the House Science, Technology & Energy Committee last year relative to HB 1569 suggested that very little RFG is delivered to areas where it is not required because the cost differential between RFG and conventional gasoline is significant enough to discourage suppliers from delivering RFG outside areas where it is required. Since there is no requirement to track where RFG is delivered to, neither DES officials nor the industry was able to supply anything

⁵ It is not expected that mixing of RFG and conventional gasoline takes place to a large extent at gasoline terminals. Any mixing of these products is more likely to occur at retail facilities when a tank containing one product is refilled with the other.

other than anecdotal evidence to support this. However, the findings from this study are consistent with the industry's contention that limited amounts of RFG are delivered to areas where it is not required. In addition, of the 40 samples taken from areas of New Hampshire where RFG is required, all of the samples had oxygen contents ($2\% \pm$ by weight) consistent with the requirements of RFG.

The scope of this study was intended to be limited to analysis of gasoline samples for MTBE content in an effort to determine the extent to which RFG is delivered outside of areas where it is required. However, the presence of ethers other than MTBE (TAME, ETBE, DIPE) in gasoline samples taken all over the state suggests that MTBE may not be the only concern relative to threats to water resources. Based on this discovery as part of this study, DES has recently proposed a requirement that all drinking water and contaminated soil samples be tested for all ethers that are known to be used as gasoline additives in an effort to determine the extent of potential problems with ethers other than MTBE.

APPENDIX A

TABULATED RESULTS FROM SAMPLES TAKEN IN NEW HAMPSHIRE'S SIX COUNTY AREA

STUDY OF REFORMULATED GASOLINE DISTRIBUTED OUTSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|-----------|---------|------|--------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| | | | | | | | | | | | | |
| 09080001 | Alton | Belknap | 1 | Reg 87 | 0.31 | 1.1 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080002 | Alton | Belknap | 1 | Sup 93 | 0.63 | 1.2 | 0.9 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080003 | Alton | Belknap | 2 | Reg 87 | 0.29 | 0.9 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080004 | Alton | Belknap | 2 | Sup 93 | 0.76 | 2.5 | 1.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080005 | Alton | Belknap | 3 | Reg 87 | 0.82 | 2.9 | 1.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080006 | Alton | Belknap | 3 | Sup 93 | 1.28 | 4.7 | 2.1 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080007 | Alton | Belknap | 4 | Reg 87 | 0.56 | 2.1 | 0.9 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| 09080008 | Alton | Belknap | 4 | Mid 89 | 0.58 | 2.1 | 0.9 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| 09080009 | Alton | Belknap | 4 | Sup 93 | 1.84 | 8.6 | 1.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 09070001 | Tilton | Belknap | 5 | Reg 87 | 0.15 | 0.4 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070002 | Tilton | Belknap | 5 | Mid 89 | 0.45 | 1.6 | 0.8 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070003 | Tilton | Belknap | 5 | Sup 93 | 0.99 | 3.4 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070005 | Tilton | Belknap | 6 | Reg 87 | 0.30 | 1.1 | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| 09070006 | Tilton | Belknap | 6 | Sup 93 | 0.33 | 1.2 | 0.4 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| 09070009 | Tilton | Belknap | 7 | Reg 87 | 0.15 | 0.3 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070010 | Tilton | Belknap | 7 | Sup 93 | 0.86 | 3.3 | 1.1 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070011 | Tilton | Belknap | 8 | Reg 87 | 0.14 | 0.3 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070012 | Tilton | Belknap | 8 | Mid 89 | 0.39 | 1.5 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070013 | Tilton | Belknap | 8 | Sup 93 | 0.93 | 3.5 | 1.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070014 | Tilton | Belknap | 9 | Reg 87 | 0.64 | 2.6 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070015 | Tilton | Belknap | 9 | Sup 93 | 1.00 | 3.6 | 1.6 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 00102502 | Conway | Carroll | 10 | Reg 87 | 0.22 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102503 | Conway | Carroll | 10 | Sup 93 | 1.21 | 6.0 | 0.2 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102504 | Conway | Carroll | 11 | Reg 87 | 1.44 | 7.6 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102505 | Conway | Carroll | 11 | Sup 93 | 0.84 | 2.3 | 1.9 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102506 | Conway | Carroll | 12 | Reg 87 | 0.15 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102507 | Conway | Carroll | 12 | Sup 93 | 0.88 | 4.2 | 0.2 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 09080010 | Wolfeboro | Carroll | 13 | Reg 87 | 0.14 | 0.3 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080011 | Wolfeboro | Carroll | 13 | Mid 89 | 0.55 | 2.4 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080012 | Wolfeboro | Carroll | 13 | Sup 93 | 0.95 | 3.6 | 1.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080013 | Wolfeboro | Carroll | 14 | Reg 87 | 0.45 | 1.8 | 0.7 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| 09080014 | Wolfeboro | Carroll | 14 | Mid 89 | 0.62 | 2.4 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09080015 | Wolfeboro | Carroll | 14 | Sup 93 | 1.13 | 3.9 | 2.1 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
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STUDY OF REFORMULATED GASOLINE DISTRIBUTED OUTSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|-------------|----------|------|---------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| 09130001 | Dublin | Cheshire | 15 | Reg 87 | 0.36 | 1.2 | 0.6 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130002 | Dublin | Cheshire | 15 | Mid 89 | 2.28 | 9.9 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130003 | Dublin | Cheshire | 15 | Sup 93 | 2.47 | 11.5 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130022 | Jaffrey | Cheshire | 16 | Reg 87 | 0.32 | 1.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130023 | Jaffrey | Cheshire | 16 | Mid 89 | 0.64 | 2.4 | 0.6 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130024 | Jaffrey | Cheshire | 16 | Sup 93 | 0.92 | 3.7 | 1.1 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130025 | Jaffrey | Cheshire | 17 | Reg 87 | 0.29 | 0.9 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130026 | Jaffrey | Cheshire | 17 | Mid 89 | 0.40 | 1.2 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130027 | Jaffrey | Cheshire | 17 | Sup 93 | 0.50 | 2.2 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130028 | Jaffrey | Cheshire | 17 | Prem 94 | 0.60 | 2.4 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130008 | Keene | Cheshire | 18 | Reg 87 | 0.37 | 1.4 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130009 | Keene | Cheshire | 18 | Sup 93 | 0.83 | 2.4 | 1.8 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130010 | Keene | Cheshire | 19 | Reg 87 | 0.68 | 2.5 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130011 | Keene | Cheshire | 19 | Sup 93 | 0.89 | 3.3 | 1.3 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130012 | Keene | Cheshire | 20 | Reg 87 | 0.31 | 0.8 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130014 | Keene | Cheshire | 20 | Mid 89 | 0.65 | 1.8 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130015 | Keene | Cheshire | 20 | Sup 93 | 0.94 | 4.1 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130013 | Keene | Cheshire | 20 | Prem 94 | 1.28 | 6.5 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130005 | Marlborough | Cheshire | 21 | Reg 87 | 0.29 | 0.8 | 0.6 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130007 | Marlborough | Cheshire | 21 | Mid 89 | 0.60 | 1.8 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130000 | Marlborough | Cheshire | 21 | Sup 93 | 1.02 | 4.6 | 0.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130006 | Marlborough | Cheshire | 21 | Prem 94 | 1.38 | 7.1 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130016 | Marlborough | Cheshire | 22 | Reg 87 | 0.35 | 1.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130017 | Marlborough | Cheshire | 22 | Mid 89 | 0.55 | 1.7 | 1.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130018 | Marlborough | Cheshire | 22 | Sup 93 | 0.95 | 2.8 | 2.1 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130019 | Marlborough | Cheshire | 23 | Reg 87 | 0.38 | 1.2 | 0.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130020 | Marlborough | Cheshire | 23 | Mid 89 | 0.96 | 3.8 | 0.9 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09130021 | Marlborough | Cheshire | 23 | Sup 93 | 1.72 | 7.9 | 1.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102514 | Berlin | Coos | 24 | Reg 87 | 0.11 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102515 | Berlin | Coos | 24 | Sup 93 | 1.24 | 5.1 | 1.4 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180020 | Carroll | Coos | 25 | Reg 87 | 1.50 | 7.8 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180021 | Carroll | Coos | 25 | Sup 93 | 0.82 | 2.9 | 1.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
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STUDY OF REFORMULATED GASOLINE DISTRIBUTED OUTSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|----------------|---------|------|--------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| 09180022 | Carroll | Coos | 26 | Reg 87 | 0.14 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180023 | Carroll | Coos | 26 | Mid 89 | 0.93 | 4.2 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180024 | Carroll | Coos | 26 | Sup 93 | 1.60 | 5.5 | 3.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102508 | Glen | Coos | 27 | Reg 87 | 0.24 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102509 | Glen | Coos | 27 | Sup 93 | 0.83 | 4.1 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102510 | Gorham | Coos | 28 | Reg 87 | 0.42 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102511 | Gorham | Coos | 28 | Sup 93 | 1.82 | 8.3 | 1.5 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102512 | Gorham | Coos | 29 | Reg 87 | 2.29 | 12.1 | 0.3 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| 00102513 | Gorham | Coos | 29 | Sup 93 | 1.04 | 4.3 | 1.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112205 | Lancaster | Coos | 30 | Reg 87 | 1.33 | 6.0 | 0.8 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112206 | Lancaster | Coos | 30 | Sup 93 | 1.22 | 4.9 | 1.2 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112207 | Northumberland | Coos | 31 | Reg 87 | 0.11 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112208 | Northumberland | Coos | 31 | Sup 93 | 0.90 | 4.5 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180003 | Ashland | Grafton | 32 | Reg 87 | 0.22 | 0.7 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180004 | Ashland | Grafton | 32 | Mid 89 | 0.60 | 2.4 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180005 | Ashland | Grafton | 32 | Sup 93 | 0.68 | 2.4 | 1.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180008 | Ashland | Grafton | 33 | Reg 87 | 0.34 | 0.8 | 0.7 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180009 | Ashland | Grafton | 33 | Mid 89 | 0.39 | 1.5 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180010 | Ashland | Grafton | 33 | Sup 93 | 0.95 | 3.6 | 1.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110302 | Hanover | Grafton | 34 | Reg 87 | 0.34 | 0.9 | 0.3 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110303 | Hanover | Grafton | 34 | Sup 93 | 0.94 | 4.0 | 0.8 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110304 | Hanover | Grafton | 35 | Reg 87 | 0.58 | 1.6 | 1.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110305 | Hanover | Grafton | 35 | Mid 89 | 0.49 | 1.9 | 0.6 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110306 | Hanover | Grafton | 35 | Sup 93 | 0.88 | 3.7 | 0.8 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110307 | Lebanon | Grafton | 36 | Reg 87 | 0.40 | 1.4 | 0.7 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110308 | Lebanon | Grafton | 36 | Sup 93 | 1.18 | 4.8 | 1.3 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110309 | Lebanon | Grafton | 37 | Reg 87 | 0.29 | 0.9 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110310 | Lebanon | Grafton | 37 | Mid 89 | 0.67 | 2.6 | 0.5 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110311 | Lebanon | Grafton | 37 | Sup 93 | 0.95 | 3.8 | 1.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
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STUDY OF REFORMULATED GASOLINE DISTRIBUTED OUTSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

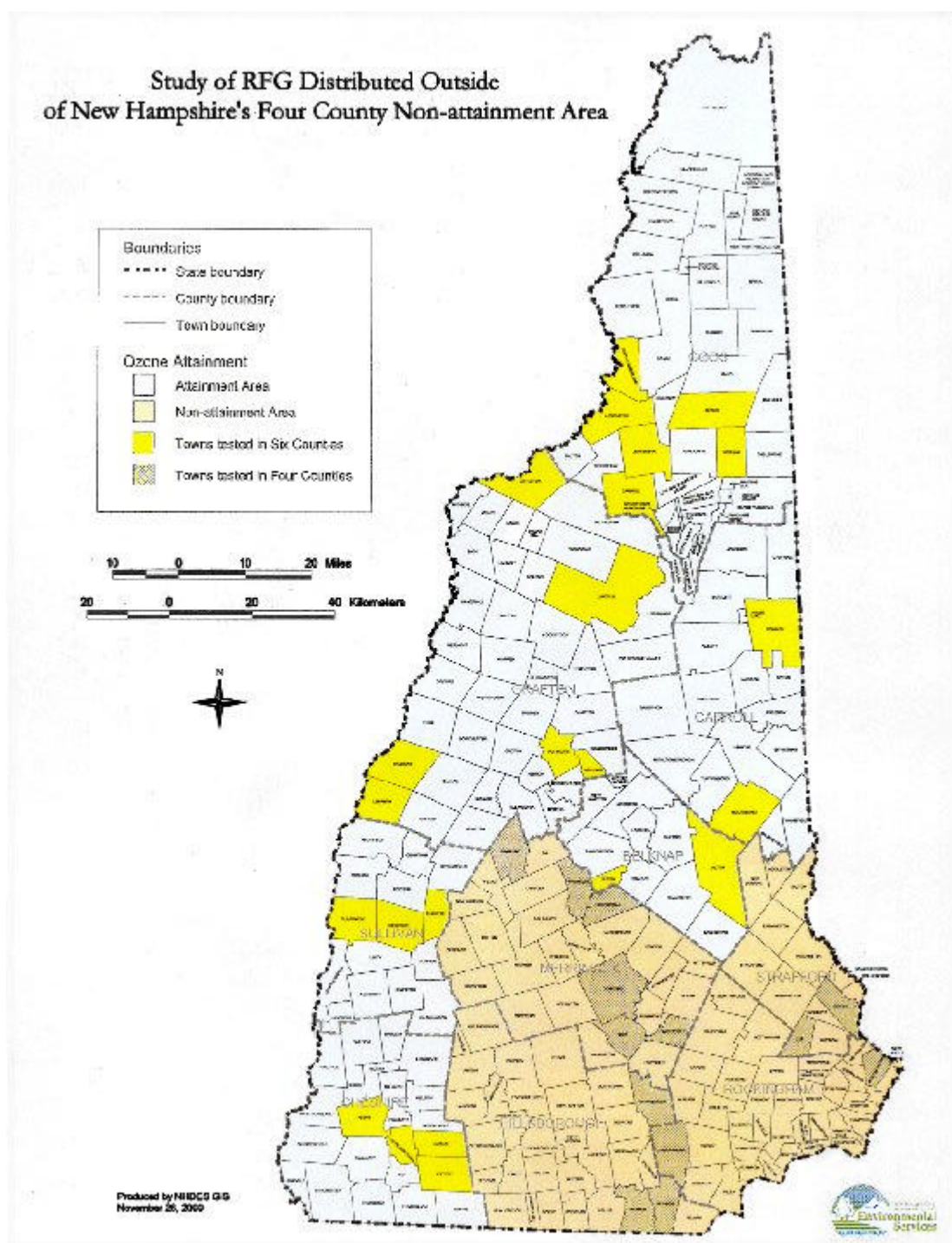
| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|-----------|----------|------|--------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| | | | | | | | | | | | | |
| 09180014 | Lincoln | Grafton | 38 | Reg 87 | 0.53 | 2.1 | 0.5 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180015 | Lincoln | Grafton | 38 | Mid 89 | 0.55 | 1.8 | 0.9 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180016 | Lincoln | Grafton | 38 | Sup 93 | 2.39 | 10.8 | 2.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180017 | Lincoln | Grafton | 39 | Reg 87 | 0.34 | 0.9 | 0.5 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180018 | Lincoln | Grafton | 39 | Mid 89 | 0.55 | 1.8 | 0.9 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180019 | Lincoln | Grafton | 39 | Sup 93 | 1.02 | 3.8 | 1.4 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180025 | Lincoln | Grafton | 40 | Reg 87 | 0.30 | 0.6 | 0.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180026 | Lincoln | Grafton | 40 | Mid 89 | 0.37 | 1.5 | 1.4 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180027 | Lincoln | Grafton | 40 | Sup 93 | 0.94 | 3.7 | 1.5 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 00112201 | Littleton | Grafton | 41 | Reg 87 | 0.68 | 0.0 | 0.0 | 3.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| 00112202 | Littleton | Grafton | 41 | Sup 93 | 0.71 | 3.1 | 0.3 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112203 | Littleton | Grafton | 42 | Reg 87 | 0.46 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112204 | Littleton | Grafton | 42 | Sup 93 | 1.39 | 6.2 | 0.9 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112210 | Littleton | Grafton | 43 | Reg 87 | 0.07 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112209 | Littleton | Grafton | 43 | Sup 93 | 0.90 | 4.5 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112213 | Littleton | Grafton | 44 | Reg 87 | 0.15 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112216 | Littleton | Grafton | 44 | Sup 93 | 0.80 | 3.7 | 0.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 09180011 | Plymouth | Grafton | 45 | Reg 87 | 0.33 | 1.1 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180012 | Plymouth | Grafton | 45 | Mid 89 | 0.55 | 1.8 | 0.9 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180013 | Plymouth | Grafton | 45 | Sup 93 | 2.27 | 11.4 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180028 | Plymouth | Grafton | 46 | Reg 87 | 0.29 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180029 | Plymouth | Grafton | 46 | Mid 89 | 0.41 | 1.6 | 1.6 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180030 | Plymouth | Grafton | 46 | Sup 93 | 0.92 | 3.5 | 1.5 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 09120019 | Claremont | Sullivan | 47 | Reg 87 | 0.55 | 2.2 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120020 | Claremont | Sullivan | 47 | Mid 89 | 0.85 | 3.6 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120021 | Claremont | Sullivan | 47 | Sup 93 | 1.12 | 4.0 | 1.8 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120022 | Claremont | Sullivan | 48 | Reg 87 | 0.38 | 1.3 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120023 | Claremont | Sullivan | 48 | Sup 93 | 0.85 | 2.7 | 1.8 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 09120008 | Newport | Sullivan | 49 | Reg 87 | 0.38 | 1.3 | 0.6 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120009 | Newport | Sullivan | 49 | Sup 93 | 2.21 | 9.8 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120011 | Newport | Sullivan | 50 | Reg 87 | 0.36 | 1.2 | 0.4 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |
| 09120012 | Newport | Sullivan | 50 | Sup 93 | 1.38 | 5.7 | 1.6 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
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STUDY OF REFORMULATED GASOLINE DISTRIBUTED OUTSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|---------|----------|------|--------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| | | | | | | | | | | | | |
| 09120014 | Newport | Sullivan | 51 | Reg 87 | 0.38 | 1.2 | 0.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120015 | Newport | Sullivan | 51 | Sup 93 | 1.79 | 7.5 | 2.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120016 | Newport | Sullivan | 52 | Reg 87 | 0.28 | 1.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120018 | Newport | Sullivan | 52 | Mid 89 | 0.50 | 2.1 | 1.4 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120017 | Newport | Sullivan | 52 | Sup 93 | 0.96 | 3.4 | 1.4 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | | | | | | |
| 09120003 | Sunapee | Sullivan | 53 | Reg 87 | 1.26 | 6.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120004 | Sunapee | Sullivan | 53 | Mid 89 | 0.50 | 2.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120005 | Sunapee | Sullivan | 53 | Sup 93 | 1.13 | 4.4 | 1.4 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120006 | Sunapee | Sullivan | 54 | Reg 87 | 0.30 | 1.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120000 | Sunapee | Sullivan | 54 | Mid 89 | 0.45 | 1.6 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09120007 | Sunapee | Sullivan | 54 | Sup 93 | 0.87 | 3.0 | 1.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |

APPENDIX B

GRAPHICAL REPRESENTATION OF GEOGRAPHIC COVERAGE OF STUDY



B-1

APPENDIX C

FINAL LANGUAGE OF HOUSE BILL 1569 (CHAPTER LAW 299)

CHAPTER 299

HB 1569-FN - FINAL VERSION

24feb00.....3480h

5/11/00.....4455s

5/11/00.....4472s

31may00.....4711-CofC

2000 SESSION

00-2539

03/09

HOUSE BILL ***1569-FN***

AN ACT requiring the department of environmental services to develop a voluntary MTBE testing program of state water supplies and to study the amount of MTBE in gasoline in the state.

SPONSORS: Rep. Martin, Hills 34; Rep. Spang, Straf 8; Rep. French, Merr 3; Sen. Wheeler, Dist 21

COMMITTEE: Science, Technology and Energy

AMENDED ANALYSIS

This bill proposes voluntary testing of all state water supplies not otherwise required to be tested for MTBE concentrations. This bill also requires the commissioner of the department of environmental services to study the amount of reformulated gasoline delivered to areas of the state where the use of reformulated gasoline is not currently required.

Explanation: Matter added to current law appears in ***bold italics***.

Matter removed from current law appears [~~in brackets and struck through.~~]

Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

24feb00.....3480h

5/11/00.....4455s

5/11/00.....4472s

31may00.....4711-CofC

00-2539

03/09

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand

AN ACT requiring the department of environmental services to develop a voluntary MTBE testing program of state water supplies and to study the amount of MTBE in gasoline in the state.

Be it Enacted by the Senate and House of Representatives in General Court convened:

299:1 Purpose. In order to minimize the contamination of our water resources and to protect the public from potentially harmful health effects, the following actions are proposed relevant to conventional and reformulated gasoline which contains the oxygenate methyl tertiary butyl ether (MTBE).

299:2 Voluntary Water Testing and Report.

I. The department of environmental services shall propose a voluntary testing of all water supplies in New Hampshire not already required to test for MTBE concentrations by any other department regulations.

II. The department shall contact by letter all public water systems in the state and describe how public water systems can best conduct these voluntary MTBE tests.

III. Such testing for surface water supplies shall be done as close to labor day as possible.

IV. The department shall compile the results of any MTBE test that a public water system voluntarily conducts and voluntarily submits to the department.

V. The commissioner of environmental services shall report findings and conclusions to the MTBE study committee established under 1999, 55. The report shall include the results of testing, a list of which public water systems conducted or did not conduct such tests, any information regarding private wells which the department may have, and any recommendations for future mandatory testing of public water supplies, including reimbursement to water systems operated by municipalities.

VI. The department shall, upon request, supply to any public water system that has conducted a voluntary test a certificate stating the results of the test and whether the water meets the MTBE standard.

299:3 Study of Reformulated Gasoline.

I. The commissioner of environmental services shall study the amount of reformulated gasoline delivered to areas in the state where reformulated gasoline is not currently required under New Hampshire's state implementation plan by analyzing levels of MTBE in a minimum of 100 gasoline samples, of all different grades of gasoline, taken from a representative selection of gasoline distribution facilities located outside Hillsborough, Merrimack, Rockingham, and Strafford counties.

II. Such testing shall either be provided by the Environmental Protection Agency or funded, upon receipt, by grant money designated to pay for the analyses.

III. The commissioner shall report findings of the study by October 1, 2000 to the speaker of the house of representatives; the president of the senate; the MTBE study committee established under 1999, 55; the house science, technology and energy committee; the senate environment committee; the governor; and the state library.

299:4 Repeal. Sections 1-3 of this act, relative to gasoline containing MTBE, are repealed.

299:5 Effective Date.

I. Section 4 of this act shall take effect July 1, 2003.

II. The remainder of this act shall take effect upon its passage.

(Approved: June 21, 2000)

(Effective Date: I. Section 4 shall take effect July 1, 2003.

II. Remainder shall take effect June 21, 2000)

LBAO

00-2539

Amended

3/7/00

HB 1569 FISCAL NOTE

AN ACT requiring the department of environmental services to propose a voluntary testing program of public water supplies for methyl tertiary butyl ether (MTBE), and to study the amount of MTBE in gasoline in the state.

FISCAL IMPACT:

The Legislative Budget Assistant has determined that this legislation, as amended by the House, has a total fiscal impact of less than \$10,000 in each of the fiscal years 2000 through 2004.

APPENDIX D

TABULATED RESULTS FROM SAMPLES TAKEN IN NEW HAMPSHIRE'S FOUR COUNTY AREA

STUDY OF REFORMULATED GASOLINE DISTRIBUTED INSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|------------|--------------|------|--------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| 00112015 | Hudson | Hillsborough | 55 | Sup 93 | 2.79 | 3.9 | 5.5 | 6.5 | 0.0 | 0.7 | 0.0 | 0.0 |
| 00000006 | Manchester | Hillsborough | 56 | Sup 93 | 2.11 | 10.5 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112002 | Nashua | Hillsborough | 57 | Reg 87 | 1.95 | 8.0 | 1.8 | 0.7 | 0.6 | 0.0 | 0.0 | 0.0 |
| 00112003 | Nashua | Hillsborough | 57 | Mid 89 | 2.03 | 9.5 | 0.7 | 0.7 | 0.5 | 0.0 | 0.0 | 0.0 |
| 00112004 | Nashua | Hillsborough | 57 | Sup 93 | 1.91 | 10.1 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112010 | Nashua | Hillsborough | 58 | Reg 87 | 1.86 | 8.3 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112012 | Nashua | Hillsborough | 58 | Mid 89 | 2.02 | 8.6 | 2.3 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112011 | Nashua | Hillsborough | 58 | Sup 93 | 2.01 | 8.9 | 2.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00000005 | Allentown | Merrimack | 59 | Sup 93 | 2.33 | 11.6 | 1.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00000007 | Bow | Merrimack | 60 | Sup 93 | 2.32 | 8.0 | 5.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290004 | Concord | Merrimack | 61 | Reg 87 | 1.94 | 8.7 | 1.4 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 |
| 09290003 | Concord | Merrimack | 61 | Sup 93 | 2.02 | 10.7 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290005 | Concord | Merrimack | 62 | Reg 87 | 1.81 | 5.9 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290006 | Concord | Merrimack | 62 | Sup 93 | 2.27 | 8.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290007 | Concord | Merrimack | 63 | Reg 87 | 2.11 | 11.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290008 | Concord | Merrimack | 63 | Sup 93 | 2.30 | 11.1 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290009 | Concord | Merrimack | 64 | Reg 87 | 1.90 | 10.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09290010 | Concord | Merrimack | 64 | Sup 93 | 2.34 | 10.1 | 1.8 | 0.7 | 0.0 | 0.4 | 0.0 | 0.0 |
| 00102601 | Concord | Merrimack | 65 | Reg 87 | 2.18 | 9.3 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102602 | Concord | Merrimack | 65 | Sup 93 | 2.38 | 10.9 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102603 | Concord | Merrimack | 66 | Reg 87 | 2.06 | 10.2 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00102604 | Concord | Merrimack | 66 | Sup 93 | 2.50 | 8.8 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09180007 | Danbury | Merrimack | 67 | Reg 87 | 2.66 | 14.0 | 0.5 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| 09180006 | Danbury | Merrimack | 67 | Sup 93 | 2.34 | 12.4 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110314 | Franklin | Merrimack | 68 | Reg 87 | 2.25 | 12.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110315 | Franklin | Merrimack | 68 | Sup 93 | 2.26 | 11.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110312 | Franklin | Merrimack | 69 | Reg 87 | 2.27 | 11.9 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00110313 | Franklin | Merrimack | 69 | Sup 93 | 2.25 | 11.3 | 0.8 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
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STUDY OF REFORMULATED GASOLINE DISTRIBUTED INSIDE OF NEW HAMPSHIRE'S FOUR COUNTY NONATTAINMENT AREA

| Sample ID # | Town | County | Site | Grade | % Oxygen (weight) | % MTBE (volume) | % TAME (volume) | % ETBE (volume) | % DIPE (volume) | % TBA (volume) | % MeOH (volume) | % EtOH (volume) |
|-------------|-------------|------------|------|--------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| 09070016 | Northfield | Merrimack | 70 | Reg 87 | 1.99 | 10.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 09070018 | Northfield | Merrimack | 70 | Sup 93 | 2.08 | 10.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112016 | Londonderry | Rockingham | 71 | Reg 87 | 1.96 | 8.6 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112017 | Londonderry | Rockingham | 71 | Sup 93 | 2.31 | 11.5 | 0.9 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112103 | Portsmouth | Rockingham | 72 | Reg 87 | 2.12 | 11.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112104 | Portsmouth | Rockingham | 72 | Sup 93 | 2.12 | 10.2 | 1.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112105 | Portsmouth | Rockingham | 73 | Reg 87 | 1.86 | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112106 | Portsmouth | Rockingham | 73 | Sup 93 | 2.12 | 11.1 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112107 | Dover | Strafford | 74 | Reg 87 | 2.22 | 11.9 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112108 | Dover | Strafford | 74 | Sup 93 | 2.24 | 11.4 | 0.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112109 | Lee | Strafford | 75 | Reg 87 | 2.16 | 11.3 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 00112110 | Lee | Strafford | 75 | Sup 93 | 2.22 | 11.4 | 0.2 | 0.4 | 0.0 | 0.2 | 0.0 | 0.0 |